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The Reflecting Media of the Atmosphere a Natural Law.

THE propagation of disease by germs, believed to be of "impure, fortuitous, and local origin," has apparently become an accepted fact; and the results of research and many experiments recorded are believed to have indubitably proved its truth.

The experiments of Dr. Angus Smith and Professor Tyndall are highly interesting and important so far as proving that a vast number of "organic" particles are at all times floating in the air of rooms; but I have observed no evidence, nor has it been in any way demonstrated, beyond the fact of their presence, that they are what they have stated them to be—"disease-germs;" or that they are of "impure origin, injurious to health, and fatal to life." So far as I can ascertain from what those gentlemen say of their researches and experiments, the constant presence only of the "organic" particles in the air of rooms has justified those assumptions; and they have been put

forth believed as truths, and accepted as such accordingly.

As nothing whatever, so far as I know, was related as done to show they were disease-germs, I could not accept such a deduction as other than pure theory, quite as likely to be based upon error as correct.

This led me to investigate for myself. I covered a window upon which the sun shined several hours in the day with black cloth. At a proper place I cut an opening in the cloth of about two inches in diameter each way; this gave me, when the sun shined, a sun-beam in the darkened chamber of about the diameter of the opening.

The floating particles were visible and numerous in the beam; this was an ascertained fact; but they were very indistinctly visible. As the sun progressed, the beam moved to other parts of the room; and presenting the same appearance of floating particles, revealed the fact that the whole of the air of the room was charged with them alike.

I took down the blind, and opened the window; and by moving the door backwards and forwards, using it as a fan for a length of time, I completely re-aired the room. I then closed the window, and readjusted the blind; and the beam reap-

peared in the fresh air, similarly charged with floating particles. This was evidence that the outer air thereabout was charged with them alike with the air of the room.

During numerous hours spent at the beam in the room on different days as the sun served, I resorted to all kinds of experiments to enlarge, magnify, and render the particles more visible. Of microscopes and magnifying glasses a variety were used; but the continued motion of the particles with the currents of air prevented their being examined. They were no sooner under observation than gone, and others passing, and gone also; not magnified, but worse-confused.

I happily thought I would throw a light upon a small part of the beam, by concentrating light transmitted through a six-inch focus glass I had previously used with no effect as a magnifier. This proved to be the very thing required as a part of a new and appropriate microscope, which I afterwards completed for their observation. Immediately I placed the glass in the beam, the beam assumed the shape of an hour-glass; the focus of the glass forming the contracted part. In this part the particles appeared to shine brilliantly; but from the concentrated heat acting upon the air, they were in such a quick whirling motion,

that I could see nothing of them individually. In the upper portion of the beam—next the glass—I could see them more distinctly; but they were not so bright as in the focus, but much brighter than in the lower part of the beam, beyond it. I could still make very little of them with the naked eye; they were very bright, but not so plainly visible as I required them. Eventually I looked at them whirling in the hour-glass beam through a watch-maker's working eye-glass; and this, although of no use to observe them through in the ordinary sunbeam, magnified them to such an extent, I was completely astonished. And now a wonderful and very beautiful sight opened to me. Innumerable tiny balls, with brilliantly illuminated surfaces, apparently so numerous as scarcely to appear separate and distinct, passed with great velocity; then a little slower, and off again with a whirling motion until suddenly, by an opposing current of air their motion was arrested, and they were for an instant stationary, and seen individually; then off with the current they whirled again, almost before I was aware they had stopped, again to repeat a similar course. What astonished me most was their grand brilliant surfaces; their close contiguity; and their being identical—all alike.

That there was much extraneous matter among them, in the shape of hair or fibre filament, scale, and art-created dust was very evident ; but that they were a body of themselves, alike and identical, was also very clear.

I had, by re-airing my room as previously related, in some respect shewn that air outside the room was similarly charged with them ; and I became now anxious to ascertain by inspection of the air in its place in each locality, far and near, pure and impure, if they were in each locality to be found the same, different, or not at all. I should want a dark chamber. My first idea in this direction was the construction of a framework over which I could throw a light-fabric black cloth. I had one made that I could set up in two minutes anywhere, either six feet by four, or twelve feet by four. But as I intended to go upon the summits of lofty mountains, on to the sea, and into narrow confined passages in towns, where the sun could peep in and serve ; it would be too cumbersome ; although it answered well with suitable holes cut in the cloth in various places, and valvular pieces of cloth pinned down over them ready for opening in the direction of the sun anywhere. I wanted something more portable, lighter, and to take less room.

Like Bunyan describing his perseverance, "I pulled, it came." I looked up some copper wire I had and constructed a wire frame, consisting of three rings of seven inches' diameter each; and straight wires eighteen inches long. I worked one ring into each end, and one into the middle, nine inches from the ends; and the wires round were four inches apart. I had then a skeleton-wire frame, seven inches in diameter, and eighteen inches long. On to each end I had stretched across, and sewn firmly all round to the rings, a double-fold of black silk. Upon the centre outside of one of the silk ends I placed an eight-inch focus glass: and placing another fold of black silk upon it, I had it firmly sewn all round to the silk end close to the edge of the glass firmly enclosing it. I then had a double-fold black silk case made, twenty inches long, that would fit all round the wire frame, and extend an inch further at the ends. This case was made open at the ends. I then cut a round piece of silk out from each surface of the glass of about two inches in diameter, which would admit sunlight direct into the frame, and put the frame into its case, with elastic bands over the ends and middle to hold it in its place. I then cut a hole in the silk case, about opposite where the focus ought to be eight inches from the glass,

for the admission of my watchmakers' magnifier, and the completion of my novel microscope. And I had then, all complete, a portable dark chamber, I could sling upon my finger and carry with ease anywhere, without assistance. And, with the aid of my microscopical arrangements, one that I hoped would give me in its interior in broad daylight, if the material to form it was present, as plain and distinct a view of my hour-glass beam as I had of the beam in my dark room. And I lost no time in seizing the first opportunity to try it, and it answered admirably. It will be observed I had the silk case made without ends; they were not necessary, there were fixed ends to the wire frame. But the object in having it so constructed was to prevent the possibility of carrying air from one locality to another; for, by slipping down three or four inches at each end, the air could blow through the wire frame from end to end freely; or the case would slip off altogether, and on again with quickness and ease at any time; so that when I examined the air of any locality, it would be always the air found there, and peculiar to it.

With my novel dark room, when the sun served, I was often at work in the mornings. And first in the street in which I live, leading immediately

out of Manchester into the country ; and, from house to house, from twenty to thirty yards wide. This street was, until several years back, lined on each side with vacant land, which for some distance on one side is now covered with small manufactories of different kinds, and house tenements ; on the other with house tenements simply ; the whole causing much impurity in the air of the place. I examined the air in it before the works commenced the day's business, and the hour-glass beam was formed, and seen as clearly in my little dark room, as in the dark room of my house. And, with the exception of the velocity and character of the motion of the particles forming it, differing from those of the house-room, arising out of the difference between the currents of air inside the house, and in the street, they were, in the brilliancy of their surfaces, in their contiguity of existence, and identity of character one with another, evidently of the same kind forming the beam in my house. There was considerable impurity among them ; and when the day's business had progressed there was much more. This direct revelation that the outer air contained the "organic" floating dust-particles, in quite as great a quantity as is found in rooms, and to all appearance of precisely the same kind, impressed

my mind with grave doubts that either their existence or origin was local or impure. And I became correspondingly anxious to test the air far away.

I next visited several confined and not over pure narrow passages and streets; in all of which the hour-glass beam was more or less brilliantly formed, evidently according as the sun served. The same kind of dust particles in apparently a similar quantity pervaded the air in these places as in the wide street and room. The quantity and kind of floating impurity differed very greatly. In the more contracted places where the sun obtained only a direct entrance in one spot, the rest in shade, getting my glass to the sun in that spot, the surrounding shade appeared to give a greater brilliancy to the particles forming the beams than they attained in a more open and purer place.

I then slipped away miles off, at different times, to private large parks, extensive open pasture lands, and on small hills: selecting apparently the purest parts, and the purest localities in those parts I could find for testing; and in all these places, miles apart from each other, and miles from my home, the "organic" particles pervaded the air in equal quantity, apparently, behaving in the same way in the air as at home; forming the

hour-glass beam with equal brilliancy; and in all respects appearing of the same kind everywhere I had been.

I next went far away, over a hundred miles from home; on the summits of high mountains, and into their valleys, apparently remote from any source of impurity; and there, in all these places, the sun serving, the hour-glass beam, formed to all appearance of the same kind of brilliant surfaced particles, on the mountain top furiously moved with the strong wind, was observed in my little dark chamber as at my distant home, the distant street, and narrow passages of Manchester: and in the open pasture lands and private parks for miles around. Over a hundred miles from home I went on to the sea shore; and there, with one foot wet with the tide, the other on the sand, the hour-glass beam was formed in like manner, with apparently like material; shewing the air in all these places to be pervaded with a similar kind of floating particle, in similar numbers, and alike in all ways.

I took a small skulling boat, perfectly clean, with no sails, and with one man only to skull, several miles out on the sea. And here on proping my glass to the sun, I was more than anxious as to the result—would they be there also? They

were in all their purity—here there was no admixture I could detect. The family of brilliants formed the hour-glass beam without any extraneous matter among them. In the air, several miles from land, over the surface of the sea, it was shown they existed the same as I had seen previously on land far away, and on the shore. The beam in this instance was very beautiful; the wind was calm, and the sun hot and powerful, with the light of course strong. The focus was brilliant; and the magnifying power appeared greater than I had seen it. The upper beam exhibited them individually at times better than at any time hitherto I had observed them; and the focus had more of a passage by descent than the whirl it generally presents. The “organic” particles forming the beam appeared all through more individually distinct; and I was more certain they were all of one kind than from any previous observation I had made.

Having demonstrated during my visits to numerous localities, pure and impure, and far distances apart, that the atmosphere in all of them, contained in an apparently equal degree, “organic” particles identical in character and attributes with those observed in the air of rooms; it appeared to me extremely improbable that a

Beneficent Creator—judging the perfection of creation from all known natural laws—would cause the existence of such a prodigious evil to all animated nature, as the existence of these particles in such countless numbers would be were they “disease germs ;” or were they in their nature, injurious to health. And I felt convinced the imputation was erroneous, and that they had some great use ; and if they had, I decided upon ascertaining what it was.

Among a variety of experiments in pursuit of this inquiry, I held an ordinary house fire-poker, polished to the end, and heated to a strong red heat in a very clear hot fire to prevent any carbonaceous matter adhering, which would create smoke, in my two-inch beam for a length of time ; the heated part of the poker extending through the beam ; and from one to three inches of the beam from the surface of the iron, became jagged and broken ; in this part the beam was not continuous ; darkness took the place of light ; and it was some little time after the withdrawal of the poker ere the beam was restored to its continuity.

Although the experiment here related was not performed in the same manner by Professor Tyndall, a number of interesting experiments of a similar character originated with, and are due to that gentleman.

One day when experimenting upon the hour-glass beam, I accidentally passed my arm through the focus, and a flood of bright light passing through the beam was suddenly arrested and reflected by my sleeve, and impressed upon my mind at once the discovery I sought. The sun's rays required to be reflected and refracted to diffuse their light through all open atmospheric space, even above all shading objects; and to many a nook and corner, to many rooms in houses, and to millions of places and localities around the surface of the earth, regularly receiving daylight, but the direct rays of the sun—never; and the atmosphere is the reflector. And these tiny brilliant particles, so numerous that they almost touch each other, buoyantly floating in the air, never still, always moving, now here, now there, everywhere, by this constant motion constantly changing their presenting surfaces to each other, and arresting upon those bright surfaces the passing light, turning it out of its direct course, and spreading in all directions, by reflection and refraction from one to another indefinitely; and yet, although so numerous, so transparent they do not obstruct our vision—we can see through them for miles—were all the time exhibiting to me in the beam, as plainly as eyes could see, though not until then

understood, their office in the atmosphere as its reflectors and refractors of light; while at the same time the air itself, in which they float, when denuded of their presence, presenting no resistance to the free transmission of the sun's light, could not reflect it and make it visible; and was confirming the exposition of the use of the floating particles, by showing its own incapacity to reflect or refract light without them. And the whole phenomena were eminently proving the reason why the particles are in such countless numbers in the air, and why they pervade all atmospheric space. They are The Reflecting Media of the Atmosphere, and a Natural Law; without the aid of which we should be almost shrouded in darkness, the sun's rays notwithstanding.

To show the transparency of the media we have only to look at any object in a room during daylight, and we see it distinctly; the media are there in all their numbers, yet we do not see them, we see the object through them; this proves their transparency.

To explain the mode of operation by the sun's light when they are rendered visible, as in a sun-beam; if powerful sunlight falls directly upon a transparent bright surfaced medium, such as a glass window, and we look at the window from

the direction of the sun's rays, the reflection of light by the glass is so powerful that we perceive the surface of the glass is become a conspicuous object, its transparency is somewhat obscured, and we cannot well see through it. Stand in the same place, and look at the window when it receives only reflected light, and the surface of the glass is not noticed, vision penetrates to beyond—we can easily see through it. In like manner the media, under certain conditions, when the sun's rays fall directly upon them, their surfaces, from reflection of strong light when surrounded by a darkened atmosphere, become illuminated and visible, as in a sunbeam,—their transparency is somewhat obscured.

Carrying this explanation further; when, under similar conditions, the sun's light is heightened and more concentrated upon the media by the focus-glass, the strong light they then reflect brilliantly illuminates their surfaces, and they become brilliantly visible; their transparency is wholly obscured. This illustrates the mode of operation, and aptitude of my novel microscope, it does but heighten in tone natural phenomena.

While experimenting with the hot poker in the two-inch beam in my house, a singularly common, but satisfactory illustration of the transparency of

the media, why they become visible, and that they are the reflectors of the atmosphere occurred.

As the sun progressed the light fell upon the narrow wood frame between two panes of glass, causing a dark line from above downwards the whole length of the beam, dividing it down the middle into two beams. It was but the shadow of the wood I know ; but in that shadow the media, now invisible, were present in all their numbers, and a minute or two before they were as visible as those in the beam on each side were then ; they had resumed their transparency. They were at work only with reflected light from other media, which was not sufficient to brighten their surfaces to such an extent as to make them visible. But they were at work, and the dark line presented through their mediation, a sort of twilight. I held an object above the dark line, and looked at it from below. I could see it distinctly ; I held the same object on one side of the beam, and looked at it from the other. I could scarcely distinguish it ; the visible surfaces of the media were the obstructions to vision.

As the hot poker approached the beam I noticed shoots of dark-air from the hot surface of the iron ; the light in the beam showed it very plainly ; and this dark-air was black,—infinitely darker than the darkened air of the room. It was air of the

room shooting from immediate contact with the hot surface of the iron, which had destroyed the media, and deprived it of its reflecting property—hence its extreme darkness.

I have been high up in the air on the summits of lofty mountains, but I have never ascended off the earth to test the air above; but that the media are in equal numbers there as they are in the air immediately over the earth's surface, and with the same attributes, the following description of mirage scenes testify, and amply explain.

“A mirage occurred at the mouth of the Forth on Sunday, May 21st, 1871. The weather was remarkably warm, and in the afternoon there was a dull, deceptive haze. The sea presented almost the appearance of a mirror, and the vessels upon it seemed to have a double reflection from the sea and the back-ground beyond. At one time the masts and rigging seemed elongated to four or five times their natural length, and then in the course of a few minutes they were reduced so as to be scarcely visible. At other times the vessels appeared to be sailing double—one ship in the sea and one in the air. Extraordinary appearances were assumed by the May Island, which rose and fell and changed to various shapes in the course of a few minutes. At one time it appeared a per-

pendicular wall rising to the height of several hundred feet, and shortly afterwards it appeared to be flat upon the surface of the sea. All the other objects which came within the range of the refraction underwent similar changes, and the illusion lasted in different phases for several hours."

The strong sunlight reflected by the sea giving it "almost the appearance of a mirror," was also strongly refracted by the media; and between the sunlight, and the powerful refraction of light by the sea their surfaces became highly susceptible of refraction, and their transparency being obscured they were partially visible, causing the "dull, deceptive haze" spoken of. Upon their bright surfaces were then portrayed the bright surface of the sea, with the vessels thereon, and objects near—May Island; and were reproduced in the air "with differing phases" because the media are always in motion—hence "the masts were at one time four or five times their natural size, then scarcely visible. Then the ships were sailing double—one ship in the sea, and one in the air—with similar representations and changes of May Island."

The radiation of the sun's rays is due to the media. For, although our atmosphere may not reach to the sun, it must not be forgotten that we

look at the sun through it, and that the result of our vision is subject to its modifications.

As regards the configuration or form of the media; according to the velocity of their motion, and as the light falls upon and is refracted from their surfaces they apparently assume various shapes. But from a noon-day sun in a shady place, and calm atmosphere, I have had them several times exhibiting reflection only, when they have shown their upper surfaces lit up crescent shaped, with the cusps obliquely downwards. None but a globular body could give this form, and they are globular. How the media are generated and regenerated I cannot at present say, and the question is too serious to simply theorize upon. But they are not of impure origin; they are not of local existence only; and they are not of themselves—in their nature—injurious to health. They are a natural constituent of the atmosphere, of general existence throughout its space, and a grand Law of Nature. Wherever atmospheric air will pass, the media, being a natural constituent, will pass also. This might possibly have an exception apart from use in some minute particular arrangement for sieving the air, but would not affect other than such an exception. Therefore, like any other natural law, its opera-

tions and attributes must be understood ere we can know what to do and avoid to receive the benefit of its operations, and escape the consequence of a neglected observance. When water, milk, beer, wine, spirits, or other fluid is poured from one vessel to another, in passing through the air numerous globules of air are carried with the liquid into the receiving vessel. In these globules countless numbers of media are contained, and many rise to the surface with air that escapes again, but millions remain immersed and are drank with the fluid.

The pressure of air upon every square inch of surface is said to be fifteen pounds; and wherever air is it presses equally every way—downwards, upwards, or laterally. With such a pressure, and also generally in motion upon the surface of fluids numerous media are continually entangled and immersed; and selecting a glass of sherry as affording a clear inspection, carefully and quietly poured from a decanter in which it has stood with a surface exposed to the air, if held in a certain position to a gaslight will shew through the whole of it dark shadows, specks—the media. When the wine is drank they are drank with it. Filter it, and as it runs from the sieve to the receiving vessel more are immersed.

The air is about the body always, and with its constant motion and great pressure numerous media are being constantly retained on the surface of the skin all over.

When bread, or any kind of pastry is made, quantities of air containing millions of media are worked into their substance.

The media, although so exceedingly minute, are not air, but a distinct substance, and have a whole surface individually; and injurious exhalations arising from clothes worn too long and dirty, or from accumulated dirt in filthy uncleaned houses, or from dirty unwashed persons will pervade the air, and coat those surfaces with their poison, and, as I have shown, will be drank with the fluids, and eaten with the solids, making the food unwholesome, and poisoning the blood—which is made from the food, and circulated in all parts of the system—and in time cause serious disease.

From the surface of the body also it will be absorbed from the surfaces of the media there in contact, into the system producing diseased effect.

The tenacity of retention of diseased poison is exemplified in the necessity of the clothes used by persons suffering from contagious diseases, being subject to great heat ere they are safe to use again.

In breathing them whilst coated with injurious

exhalations is the greatest risk. We see daily how speedily from varieties of inhalation the system is affected. I have long been of opinion that consumption may be communicated from one person to another. I have known wives after the husbands have died of consumption to complain, and eventually die of the same disease. And I have seen a few husbands follow the wives—but the wife more frequently follows the husband. This is explained by the media of the air breathed by the consumptive person, passing continually in and out of lungs reduced to a puddle, being coated with diseased matter, and in that state for hours at a time taken in and out of the lungs of the healthy person, inoculating them with the specific ailment. And the wife being in more constant attendance upon the husband under such circumstances than the husband upon the wife will explain why the latter more frequently suffers.

And it goes far to show how speedily and in what way contagious diseases such as malignant ulceration of the throat, scarlet fever, diptheria, and the like affect persons near. The media coated over with the specific virus of the disease from passing in and out over the ulcerated surfaces of the throat and mouth, and in contact and away again with membranes peculiarly affected, apply it to those near in the way explained.

It is well known that an odour can be tasted, the media coated with the odorous particles, carry them upon the tongue, upon which every time the mouth opens they are applied in millions.. It is a fact that the air is everywhere pervaded with the media in such numbers that the space between and without them is very slight, scarcely distinguishable. It is therefore evident we both eat, drink, breathe, and take them upon the tongue; and that they are constantly in contact with every part of the surface of our bodies. If the air is unclean from unhealthy exhalations for want of cleanliness, it is evident the media persistently apply those unhealthy exhalations to all parts of our system, and we suffer from our own negligence; but if the air is kept pure by proper cleanliness, they as constantly only perform the duties of their office, and administer to our benefit, pleasures, and enjoyment of life, by the distribution and diffusion of light above and around the whole surface of the earth.

As a knowledge of this Natural Law becomes unfolded to our understanding, we cannot but feel impressed with its grand proportions, and the great simplicity of the arrangement. But when we reflect upon the extent, magnitude, and absolute necessity of its existence, of the void there would

be of all that is pleasing and beautiful in life without it, of the exhilarating and buoyant influence to all animated creation of a bright and sunny day, when the birds hail the light and fill the air with pleasing song; and the far distant landscape with its hill and dale, its tall trees with their waving foliage and ever-changing hue, springing from out the green herbage of meadows, sprinkled with beautiful flowers, and intersected with winding and laving rivulets, as far as the eye can see, and filling the mind with the beauties of Nature; when we become conscious of all these, and that all is made visible and enjoyable through the agency of the media only; and that the very existence of a great part of it is much dependent upon light, we shall entertain some knowledge of the great importance and necessity to all earthly creation of the magnificent and beautiful attributes of this wonderful Law of Nature.

And with all the hoard of our knowledge of creation we shall be humbly impressed with a conviction of how much there may be yet to learn, when we reflect that the world has advanced to this stage of existence without a knowledge of this law, though its operations and results have at all times, since light was, surrounded and served us. And the more so, when, in pure ignorance, the

first part of a revelation was accepted with a loathing disgust, and the name assigned it of a dire pestilence. And we shall hail a true knowledge of it that it is not so with a great feeling of relief, and accept its true attributes with thanksgiving, joy, and gladness.



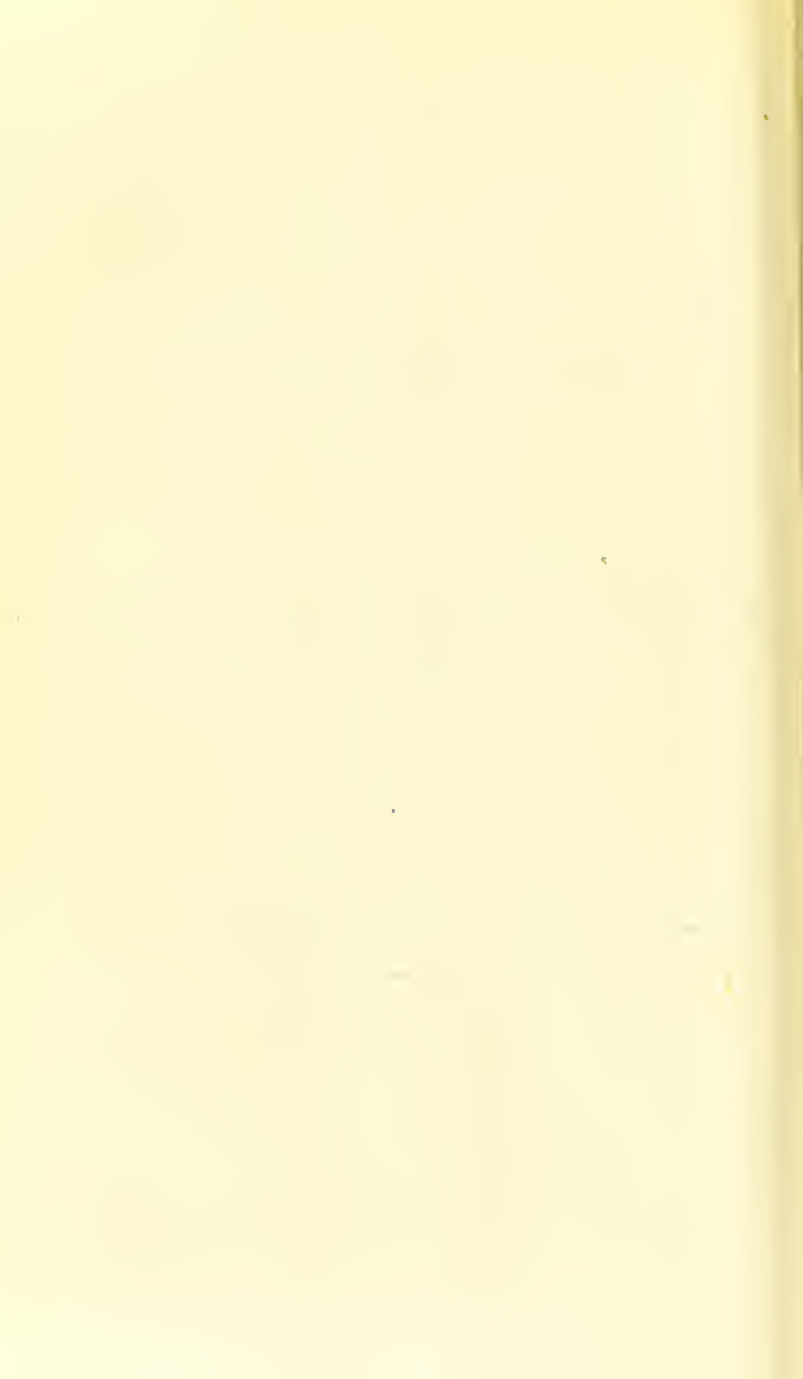
A TREATMENT

OF

SMALLPOX, SCARLET FEVER,
AND MEASLES,

WHICH

IMMEDIATELY CHECKS THE DISEASE, LEADS TO A SPEEDY
CURE, AND PREVENTS FATALITY.



A Treatment of Smallpox, Scarlet Fever, and Measles.

BRAIN, nerves, heart and blood vessels, lungs, stomach, bowels, liver and kidneys, with the skin, various membranes, and others it is not necessary to enumerate constitute the organs, or to use a more expressive term for nonprofessional readers, the organic machinery of the body, from the action of which life and health result.

During life, blood containing the elements of nutrition and regeneration of the organism constantly flows from the heart through the arteries to all parts of the body, and back from all parts of the body through the veins to the heart again, there to be mixed with new blood containing new elements of nutrition and regeneration made in the stomach, bowels, &c., from the food we take, and sent to the heart for that purpose.

This constant circulation of the blood to and through all parts of the system is the moving medium and distributive power of action of all the organs.

If we examine a beautiful fabric made by machinery in perfect working order, we shall find the fabric perfect in all its parts ; but if any part of the machinery be out of order—in bad working condition—we shall find the fabric show imperfection in make ; and if the whole machinery is out of order the fabric could not be made at all.

So it is with the human body, the organs named with others being its machinery, the result of their united work is life, of their perfect work health also.

If one or more organs are out of order, their work is imperfect, and the result is the opposite of health—more or less disease ; and according to the importance of the organ and the extent of derangement the disease is more or less severe and serious. If the whole system is involved in the derangement health is gone, the disease is serious, and life in peril.

Eruptive diseases such as smallpox, scarlet fever, and measles, have for a long time at periods largely and prevalently assumed the latter character, and have been largely fatal. Much time, skill, energy and wealth have been expended to prevent their unfortunate occurrence, but without avail ; they are still at times as prevalent as ever, and equally fatal.

Disease assumes various phases and a variety of characters, but it is not necessary for the purposes of this work to refer to such distinctions otherwise than generally.

Medicinal agents through the stomach are the great means relied upon to arrest the progress of such serious derangements of the whole system as these diseases often at once present ; but the brief outline I have given of the human economy will show the cause of their frequent failure—even of the most skilfully prescribed medicines, however diligently they are administered, and whatever care is taken in nursing.

The office of the stomach is, with the aid of other organs concerned in digestion, to reduce what is taken into it to a condition similar to the blood, afterwards to be mixed with the blood, and form part of it, and circulate through the system to all its parts. But in these cases of disease the stomach and assistant organs are no longer capable of performing their office of assimilation ; and though medicinal agents exert a greater influence than food they are often unappropriated in the stomach, do not get into the blood, and have no influence in checking the progress of the disease. This is the cause of their failure. And when they do avail, from the causes named their

influence is often so slow, the disorder assumes such fearful proportions, that all the agonies almost up to death are suffered, and often much permanent injury done before the goal of safety is reached.

The skin and all other membranes of the body, although in the various parts their functions are very different from each other, are to a great extent a continuation of each other. There are not wanting instances of a serous being a continuation of a mucous membrane, and performing very different functions so soon as it passes from a mucous to a serous cavity.

And various diseases strongly illustrate their analagous character. If a baby has thrush, the eruption in the mouth passes on through the bowels on to the skin outside around the anus. And though the eruption in the mouth, and on the skin outside, is one and the same disease, its appearance on the two membranes is very different, and it does not look like the same disease.

In smallpox the pustules are seen covering the tongue, inside the cheeks and throat, and sometimes on the eyeball—on the cornea, producing blindness of the eye upon which such a pustule occurs—as they are seen, covering the skin. In scarlet fever and measles the peculiar rash of such

is observed in the mouth and throat as on the skin.

All these are strong evidences of analogy in character of the various membranes of the body, and that a disease which affects one may involve the others easily. And when we consider the immense importance of the various functions of the various membranes to healthy vitality, we shall feel no surprise at the serious disturbance to the whole system, and fatal termination of a severe attack of either smallpox, scarlet fever, or measles.

Smallpox, scarlet fever, and measles are essentially diseases of the membranes of the system generally; local organs or other parts of the system follow in morbid action from sympathy with them; but from the importance spoken of of the functions of the membranes they are speedily involved.

As we cannot prevent the occurrence of these eruptive fevers, could the seriously progressive derangement of the membranes and organism so fatal in them be fairly met and successfully opposed by treatment when they do occur, so as to arrest speedily their fearfully increasing progress, and quickly restore the tone and power of action to the membranes and organs involved, a resisting vital force would be set up to the action

of the peculiar poison of the disease, which, with the known influence of appropriate medicines passing by means of the restored action of the stomach, &c., into the blood and with it into the system, would shortly remove all symptoms of the disease, restore the organism to healthy action, and the patient to convalescence. And it would also prevent the acute suffering, the contagious exhalations, the long anxious watching and nursing, and fatal termination of their unchecked existence; and, as a large portion of the death register is due to their victims, would greatly diminish its proportions.

*This to a great extent may be accomplished.

The warm bath has all this beneficial influence upon the diseased blood, membranes, organs, and system generally in all these eruptive fevers.

When I speak of a warm bath I mean the body immersed up to the neck in warm water only, without the addition of mustard, salt, or any other substance whatever.

The effects of a warm bath are believed simply to determine to the skin and promote sweating, and that their use is weakening; and as a consequence, the general opinion is, it would not do to take them at other times than on special occasions—as when a good sweat, or a good washing is required.

These opinions are erroneous, as I shall hereafter explain.

The symptoms known as fever are always felt three or four days before the eruption appears; and the eruption is inflammation in the membranes affected with it; but before it becomes inflammation there is congestion—a thickened condition of the blood which stops sluggishly in the blood vessels, does not flow freely as it does in healthy life, and in the place of giving power of action and tone to the organs it supplies it clogs and disorders their every effort.

Smallpox commences with a coldness or shivering, with headache, pain in the limbs all over, and a tired feeling, the whole often coming on suddenly, with nausea and vomiting, oppressed breathing, a little dryness and soreness of the throat, with cough. In two to four days an eruption appears in the form of small red pimples, first upon the skin of the face, and shortly all over the surface of the body. In about three days the pimple eruption shows it contains a thin fluid, and is slightly depressed in the centre, and in three or four days more a thick matter will be observed to have taken the place of the thin fluid, and the pustules will shortly afterwards begin to scab. During the active existence of the eruption the face and body covered with it are

swollen, and in consequence of the swelling in the eyelids it is often impossible to open the eyes ; and if the mouth is examined, the tongue, inside the cheeks, and throat will be observed to be covered with the eruption the same as the outer skin.

At this stage of the disease, serious impediments to a free and proper circulation of the blood, and to a proper and vigorous action of the various organs of the body have been in operation from before the time the eruption appeared : and if the treatment used has been inoperative the disease will have progressed unchecked, having full possession of the system, and will have much changed in character ; all the membranes of the body, including those of the brain will be involved, delirium ensue, and the patient in a very precarious condition, and life in peril.

On the febrile symptoms first appearing, or when the eruption has appeared, but the earlier the better, immerse the patient up to the neck in warm water, as warm as he or she can do with it, and keep it so warm by adding more warm water occasionally for a quarter of an hour, during which time the patient must remain in it. And each day until the eruption has appeared and subsided the warm bath must be repeated in a similar manner in cases where the eruption is confluent

and the attack severe. In milder cases where the eruption is slight, two or three baths will suffice ; and in the more severe cases it is not necessary to continue the bath daily for so long a time as mentioned above as regards the disease, because the severe symptoms will have given way to the second or third bath ; but the bath has such a beneficial influence upon the eruption, raising it from being deep seated in the skin and membranes to their mere surface, and prevents their being marked to the extent usual in the ordinary course of smallpox. It also the sooner enables the skin and membranes to recover their natural tone, and promotes a more speedy convalescence.

It will be observed that I have not directed any particular degree of temperature for the bath, I have said as warm as the patient can do with it ; and the reason is, a thermometer is not found in every house, nor would it be understood if it was ; but the inmates of every house are liable to have smallpox, every one can get warm water for a bath, and every one can understand when told it is to be as warm as the patient can do with it. To suit everyone therefore, that direction is the most applicable.

And there are numerous houses where they could not find a vessel sufficiently largo to lay the

patient up to the neck in warm water ; in such a case let them sit in warm water the time, it answers the purpose, I have had to try it ; but it does not do so well as a whole immersion. The manner in which the warm bath acts is as follows:—The impressible fluid softly and comfortably adapts and applies itself closely and minutely to every part of the surface of the body immersed in it ; it touches the skin everywhere all over ; and the heat it contains is speedily communicated to the capillary blood-vessels and nerves in every part at once ; the blood in the vessels serving the skin, the nerves, and the substance of the bloodvessels themselves, loses the thickened congested condition which prevents its moving, and the parts it supplies acting, and assumes at once a more natural fluidity, flowing freely ; and a general artificially increased impulse being given and maintained by the all surrounding heat, the parts again assume an energy of action which soon reaches the heart itself, the internal membranes, the nervous centres, the stomach, bowels, and organism generally ; the blood in the whole system then flows more freely, and the whole system, by the same means, and in the same way, speedily resumes a vitality and energy capable of power-

fully resisting the poisonous effects of the disease, which receives an immediate check to its virulent career. And, by the time the patient has had the third bath, all the threatened dangerous severity of the disease has passed away, and it assumes a modified simplicity of character, with little suffering, and no danger; and, with the simple medicinal treatment only required in the mildest cases, it is speedily cured, and the patient soon and easily restored to convalescence.

The first bath, if given after the eruption has appeared, does not appear to have relieved the feelings of the patient to much extent, but the second produces an entire change in them and the character of the disease.

As regards the prevention from the contraction of smallpox by revaccination, I will relate an interesting case. I was called in to see a young girl of nineteen. She had the eruption and the disease in a confluent form, with every appearance of a dangerous progress. Though they had only a bath she could sit in, partly immersed only, she did well. They had nine children, she the eldest. About ten days from my first seeing her, the next, seventeen, who had slept with her up to my seeing her, and another, nine, were suddenly seized with all the febrile symptoms of a

severe attack. I found the mother crying, and the father much depressed. They were put into the bath at once, prescribed for, and speedily got well with very slight eruption as I have generally observed when the bath is used from the first onset of the disease. I revaccinated father, mother, and three children in the house at once, and none of them afterwards took it. Three youths out at business who were to have come down, did not come, and I did not revaccinate them. About a fortnight after I ceased visiting the two, I was called to one of the youths who had been seized. He did well; and I insisted upon the other two being sent down to me at once. They were so, and I successfully revaccinated them. Neither of them took the disease. Revaccination here would seem to have had a special preventive influence.

I found in my need an excellent preventive substitute for revaccination. Having no lymph I could rely upon, and observing the wonderful influence of the warm bath upon the disease itself, I conceived the plan of putting the inmates not yet afflicted, where I had cases of smallpox, into a warm bath daily, as a prevention to their contracting the disease; and in no instance has one of them taken the disease. I cannot affirm

positively in favour of the warm bath as a preventive ; but no individual, either servant, child, or heads of family using it as a preventive has taken the disease, though subject to the presence of its contagion. Yet of its preventive property there is only a presumptive proof ; of course I cannot say any one of them would have taken the disease had they not used it. The warm bath is of pleasant use, easily comeatable, and worthy of fair trial—as, if it succeeds, it will be a grand element of safety and preservation of life ; and would also give confidence to those nursing cases, and go far to absolve them from fear.

Scarlet fever and scarlatina are names of the same disease. It commences with a feeling of coldness, a weary restlessness, headache, want of appetite, thirst, a little nausea, soreness and swelling of the throat, with small red spots all over the surface of the tongue. In from three to five days a scarlet coloured rash appears on the skin of the face and neck, and soon extends all over the surface of the body.

This disease has been singularly unmanageable and fatal ; three or four victims in a family, in rich and poor alike, have not been an uncommon occurrence all over the country.

The earlier attention is paid to this disease, and the better it will be—a great deal. The warm bath is singularly beneficial and expeditious in its effects in scarlatina; even after the eruption has appeared if only used for the first time then.

The congestion and subsequent speedy inflammation or ulceration of the throat being a prominent and troublesome symptom, the patient if possible should be immersed wholly up to the neck in the warm water as warm as he can do with it, and kept so warm by the addition of warm water for fifteen minutes. The body should then be dried with a warm towel, and the ordinary night clothes put on, and he should then be put to bed and covered over with good warm bed clothing, but not heaped up clothing to make him sweat, that is not necessary, and is not useful. The bath should be repeated the next day in a similar manner, and the next also.

The first bath has a great influence upon the disease, but it is not specially evident; the patient still complains of being very ill, and those in care often do not think he is any better, but after the second bath there is a manifest change, the patient exhibits every appearance of relief, and the disease is much modified; the

threatening febrile symptoms involving the whole system, and soreness of the throat, appear to subside at once—and it is frequently not necessary to do anything special to the throat, in cases having every appearance of being serious, and requiring great and special attention. It is seldom necessary to give more than three or four warm baths, often not more than two are required.

The simple medicinal treatment used in the mildest cases is necessary only in treatment.

The strong spirituous stimulant treatment used in these diseases is not necessary with the use of the warm bath; and more, it will not be serviceable but the contrary. I have rarely seen the swelling—anasarca—which usually follows attacks of this disease succeed attacks treated with the warm bath.

The mode of action of the bath on the membranes, organs, and system generally is similar to that described in smallpox.

Measles commence with symptoms of fever also, accompanied by sneezing, difficult breathing, and cough; and a rash appears in three or four days on the surface of the skin. Measles have often serious complications, and the lungs being so importantly affected, and their use being

so important to life, when the disease is seriously complicated it becomes very fatal. The warm bath used early as directed in smallpox and scarlet fever, has the same beneficial effect. Not more than two, often not more than one is required. Delay in its use in this disease is more serious than in the others.

Smallpox is a disease peculiar to itself, scarlet fever is a disease peculiar to itself, and measles is a disease peculiar to itself—each essentially different from the other; but notwithstanding their essential difference, the warm bath restores to the whole system vital energy and resisting power to the action of each disease in the manner described when speaking of smallpox.

Of course there are some cases of eruptive fever subject to peculiar circumstances, and here and there one of peculiar complication which may apparently defy all attention. Professional aid ought to be obtained as early as possible in every case; for often it is observed in eruptive fevers, in scarlet fever especially, that serious progress is made before medical aid is obtained or even sought; and also what fatal effect a few hours of unchecked progress produces on the system; and, as a warm bath can be at once obtained in every house, and, as in every case in

which it is promptly and properly used, it immediately checks the progress of the disease, and changes its character and results as I have described, it is evident that if the heads of families, rich or poor, are taught and made acquainted with its use and beneficial effects, they would promptly use it to any of their families afflicted ; and numerous lives, now sacrificed either from entire neglect, delayed attention, or other causes I have described, would be saved.

This consideration has induced me to publish this for the public generally ; to abstain from the use of all professional terms ; and to avoid all superfluous verbiage, in order to curtail its proportions, that I might present it at a cost attainable by all. And so I send it forth, with a proved certainty that what it contains is true, and bid it God-speed.

